Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code: 150601 **Date:15/12/2015**

Subject Name: Highway Engineering

Time: 10:30am to 1:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain briefly about Third Twenty Year Road Development Plan of India.	**07**
	(b)	Discuss briefly about the road user characteristics and their effects in traffic performance.	**07**
Q.2	**(a)**	Derive an expression for finding the stopping sight distance at level and at grade on highway.	**07**
	(b)	What are the desirable properties of subgrade soil? Briefly describe CBR test procedure for laboratory test.	**07**
		OR	
	(b)	Discuss about various problems in hill road construction and how they are overcome.	**07**
Q.3	**(a)**	Briefly explain the engineering surveys needed for deciding new alignment of highway.	**07**
	(b)	Design the super elevation required at a horizontal curve of radius 340m for speed of 80 kmph. Assume suitable data.	**07**
		OR	
Q.3	**(a)**	Explain with sketch Los-Angeles abrasion test for aggregates.	**07**
	(b)	An ascending gradient of 1 in 100 meets a descending gradient of 1 in 150. Design a summit curve for a speed of 80 kmph so as to have an overtaking sight distance of 480m.	**07**
Q.4	**(a)**	Explain with sketch Softening point test for bitumen.	**07**
	(b)	What are the objects of camber? Describe with neat sketches the methods of eliminating camber and introduction of super elevation.	**07**
		OR	
Q.4	**(a)**	Discuss with sketch spot-speed survey by enoscope.	**07**
	(b)	Suggest and describe suitable method of stabilization of Black-cotton soil for road construction.	**07**
Q.5	**(a)**	Discuss the importance of highway drainage. Briefly explain with sketch sub-surface drainage system with transverse drains.	**07**
	(b)	Differentiate between flexible and rigid pavements. What are the various factors to be considered in pavement design?	**07**
		OR	
Q.5	**(a)**	Write a short note on road side Arboriculture.	**07**
	(b)	Explain with sketches mandatory signs and warning signs to control the traffic.	**07**

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